

REMARKS

Claims 1-12, 14-16, and 18 are currently pending in the subject application, and are presently under consideration. Claims 1-12, 14-16, and 18 are rejected. Claims 13 and 17 have been indicated as allowable if rewritten in independent form. Claim 1 has been amended. Claim 13 has been cancelled. Favorable reconsideration of the application is requested in view of the amendments and comments herein.

I. Rejection of Claims 1-3, 5, 6, 8, 9, 11, 14-16 and 18 Under 35 U.S.C. §103(a)

Claims 1-3, 5, 6, 8, 9, 11, 14-16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,774,591 to Black, et al. ("Black") in view of "*Expert System for Automatic Analysis of Facial Expression*" by Pantic ("Pantic"), and further in view of "*Application of Face and Gesture Recognition for Human-Computer Interaction*" by Reilly ("Reilly"). Claim 1 has been amended. Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claim 1 has been amended to substantially include the elements of claim 13, now cancelled. Claim 13 has been indicated as allowable if rewritten in independent form. Therefore, claim 1 should now be in a condition for allowance. Withdrawal of the rejection of claim 1, as well as claims 2-5, 14, and 15 which depend therefrom, is respectfully requested.

Claim 6 recites an optical imaging device configured to obtain a first image of substantially all of the face of the human subject at a beginning of a pulse period associated with a pulsed light source, to obtain a second image of substantially all of the face of the human subject at an end of the pulse period, and to subtract the second image from the first image to generate a resulting image of substantially all of the face of the human subject having a high contrast ratio. In the Office Action dated August 20, 2007 (hereinafter "Office Action"), the Examiner relies on Reilly to teach this element of claim 6 by stating that Reilly discloses "two images...captured and subtracted," and "two frames...used for determining motion estimation," (Office Action, page 7; citing Reilly, page 22, paragraph 4; page 21, paragraph 6). Representative for Applicant respectfully disagrees.

Reilly discloses that incident laser light is provided on the surface of a scattering object to produce a speckle pattern (Reilly, page 21, paragraph 6). Two consecutive frames are compared by loading them into a first-in-first-out (FIFO), such that one frame is cross-correlated with the next by shifting the frame to the left and to the right about a central pixel (Reilly, page 21, paragraph 7). Thus, a movement and direction estimate can be obtained based on the cross-correlation (Reilly, page 21, paragraph 7). However, this disclosure by Reilly does not demonstrate that an image of substantially all of a human face is obtained, and discloses nothing about a pulse period, such that a first image of all of a human face is obtained at the beginning of the pulse period and a second image of all of the human face is obtained at the end of the pulse period, as recited in claim 6. Instead, Reilly appears to disclose that select areas of the face are modeled (Reilly, Figures 3, 4, 7, and 8), and discloses only that consecutive frames are studied, as opposed to images taken in a defined pulse period. In addition, the cross-correlation disclosed by Reilly is nothing more than a comparison, and is therefore not a subtraction of two separate images to obtain a resulting image having a high contrast ratio, as recited in claim 6.

Reilly also discloses that features are located based on a skin color model (Reilly, page 22, paragraph 3). To obtain the skin color model, an image with eyes open and an image with eyes closed are each obtained, and a color distance of the two images is calculated on a pixel-by-pixel basis (Reilly, page 22, paragraph 4). Equation 1 of Reilly shows that the color distance is a square-root of a sum of squared differences of each of red, green, and blue for each pixel (Reilly, Equation 1). However, this equation is not the capturing of two images of substantially all of the face of a human and the subtraction of the two images to generate a resultant image having a high contrast ratio, as recited in claim 6. Instead, Equation 1 merely discloses a way to obtain a color distance for each pixel that includes a difference of each of the three base colors as a portion of an equation for images of the opened and closed eyes of the human subject to detect the face of the subject.

Therefore, for all of these reasons, Reilly does not teach or suggest an optical imaging device configured to obtain a first image of substantially all of the face of the human subject at a beginning of a pulse period associated with a pulsed light source, to obtain a second image of

substantially all of the face of the human subject at an end of the pulse period, and to subtract the second image from the first image to generate a resulting image of substantially all of the face of the human subject having a high contrast ratio, as recited in claim 6. The addition of Black and Pantic does not cure the deficiencies of Reilly with respect to the recitations of claim 6.

Therefore, Black, Pantic, and Reilly, individually or in combination, do not teach or suggest claim 6. Withdrawal of the rejection of claim 6, as well as claims 7-11 and 16-18 which depend therefrom, is respectfully requested.

II. Rejection of Claims 4 and 10 Under 35 U.S.C. §103(a)

Claims 4 and 10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Black in view of Pantic further in view of Reilly and further in view of U.S. Patent No. 7,095,901 to Lee, et al. ("Lee"). Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claim 4 depends from claim 1. As described above, claim 1, as amended, should now be in a condition for allowance. Therefore, claim 4 should likewise be allowed over the cited art. Withdrawal of the rejection of claim 4 is respectfully requested.

Claim 10 depends from claim 6. As described above, Black, Pantic, and Reilly, individually or in combination, do not teach or suggest claim 6, from which claim 10 depends. The addition of Lee does not cure the deficiencies of Black, Pantic, and Reilly to teach or suggest claim 6. In addition, claim 10 recites that the optical imaging device includes means for measuring axial distance to a critical area of the face, and the means for recording frame-to-frame changes in critical area positions includes means for recording changes in axial distance, to facilitate detection of axial pulsing movements in the critical area of the face. The Examiner relies on Lee to teach claim 10, stating that "Lee teaches an apparatus for obtaining iris images including means for measuring axial distance to a critical area of the face and means for recording frame-to-frame changes in critical area positions includes the means for recording changes in axial distance to facilitate detection of axial pulsing movements in a critical area,"

(Office Action, page 10; citing Lee, col. 4, line 61; FIG. 12, reference number 703).

Representative for Applicant respectfully disagrees.

Lee teaches a method for adjusting a focus position in an iris recognition system (Lee, Abstract). Specifically, the system of Lee measures a distance from a camera to a user to indicate to the user if the user is within an acceptable range for iris recognition (Lee, col. 6, ll. 26-28; col. 7, ll. 38-52). Representative for Applicant respectfully submits that the measurement of a distance from a camera to a user, as taught by Lee, does not correspond to recording changes in axial distance, as recited in claim 10. Specifically, Lee merely teaches static distance measurement, and not the recordation of changes in axial distance. In addition, Lee monitors the distance between the user and the camera to determine if the range is acceptable, and not to detect axial pulsing movements. In rejecting claim 10, the Examiner provides no citation in Lee or any other reference for facilitating detection of axial pulsing movements, as recited in claim 10 (Office Action, page 10). Therefore, Lee does not teach or suggest recording changes in the axial movement to facilitate detection of axial pulsing movements, as recited in claim 10.

Representative for Applicant additionally respectfully maintains the position that, even assuming *arguendo* that movements of the user's head in the teachings of Lee can be considered axial pulsing movements, the movements, as taught by Lee, are of the user's entire head, and are thus not in critical areas of the face, as also recited in claim 10. In the Office Action dated March 7, 2007, the Examiner appears to rebut this argument by stating that "the axial pulsing distance can be broadly interpreted as the distance between the individual's head and the camera," (Office Action dated March 7, 2007, page 5). Representative for Applicant respectfully submits that such a statement fails to appreciate the meaning of the word "pulsing", as it is used in the recitation of claim 10.

Furthermore, the rejection of claim 10, as well as the above statement provided by the Examiner, also fail to appreciate that the axial pulsing distance, as recited in claim 10, corresponds to the critical areas of interest. The teachings of Lee are not directed to critical areas of interest other than an ocular iris, and is only directed to such for purposes of determining acceptable range for recognition, and not for detecting changes in axial pulsing movements. As

described above, the only motion that can be considered from the teachings of Lee are those of an entire head. One of ordinary skill in the art would not consider the entire head as a critical area of interest, such as those known to be affected involuntarily when the subject is exposed to emotion-provoking stimuli (see, *e.g.*, Present Application, paragraph 15). Therefore, Representative for Applicant further respectfully submits that one of ordinary skill in the art would not be motivated to combine the teachings of Lee with the teachings of Black, Pantic, and/or Reilly to achieve the recitations of claim 10. Accordingly, Black, Pantic, Reilly, and Lee, individually or in combination, do not teach or suggest claim 10. Withdrawal of the rejection of claim 10 is respectfully requested.

III. Rejection of Claim 7 Under 35 U.S.C. §103(a)

Claim 7 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Black in view of Pantic further in view Reilly and further in view of U.S. Patent No. 6,549,664 to Yamamoto ("Yamamoto"). Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claim 7 depends from claim 6. As described above, Black, Pantic, and Reilly, individually or in combination, do not teach or suggest claim 6, from which claim 7 depends. The Examiner relies on Yamamoto to teach the elements of claim 7. However, the addition of Yamamoto does not cure the deficiencies of Black, Pantic, and Reilly to teach or suggest claim 6, from which claim 7 depends. Therefore, Black, Pantic, Reilly, and Yamamoto, individually or in combination, do not teach or suggest claim 7. Withdrawal of the rejection of claim 7 is respectfully requested.

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CONCLUSION

In view of the foregoing remarks, Applicant respectfully submits that the present application is in condition for allowance. Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Please charge any deficiency or credit any overpayment in the fees for this amendment to our Deposit Account No. 20-0090.

Respectfully submitted,

Date

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